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OBSERVATIONS ON A LIVING SPECIMEN OF THE GIANT HYDROID *BRANCHIOCERIANTHUS IMPERATOR*

by

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The largest known solitary hydroid, *Branchiocerianthus imperator* (Allman, 1885), was first collected on June 17, 1875, with a trawl-net, off Boso Peninsula on the Pacific coast of Japan, during the Challenger Expedition; it was described as *Monocaulus imperator* Allman, 1885. On June 21, 1985, 110 years after its discovery, a living specimen was observed for the first time, using the submersible "Shinkai 2000". The species is a suspension feeder and a carnivore: a symbiotic shrimp was found associated with it. Recently the species has been recognized from photographs taken in deep water of the N.E. Atlantic by the French IFREMER/CEA Expedition, apparently the first Atlantic record.

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Branchiocerianthus imperator (Allman, 1885) is known to occur in the Indo-West Pacific at depths ranging from 50 m (East China Sea) to 5,307 m (western North Pacific). Its taxonomic and zoogeographical aspects have previously been studied (Allman, 1888; Millard, 1978; Miyajima, 1900; Stechow, 1909, 1909a; Vervoort, 1966; Yamashita, 1980), but nothing is so far known about its features in its natural habitat. The present specimens were observed off Odawara in Sagami Bay, Japan (34° 13.5′ N, 139° 12.6′ E) on the occasion of dive # 179 of the Shinkai 2000 of the Japan Marine Science

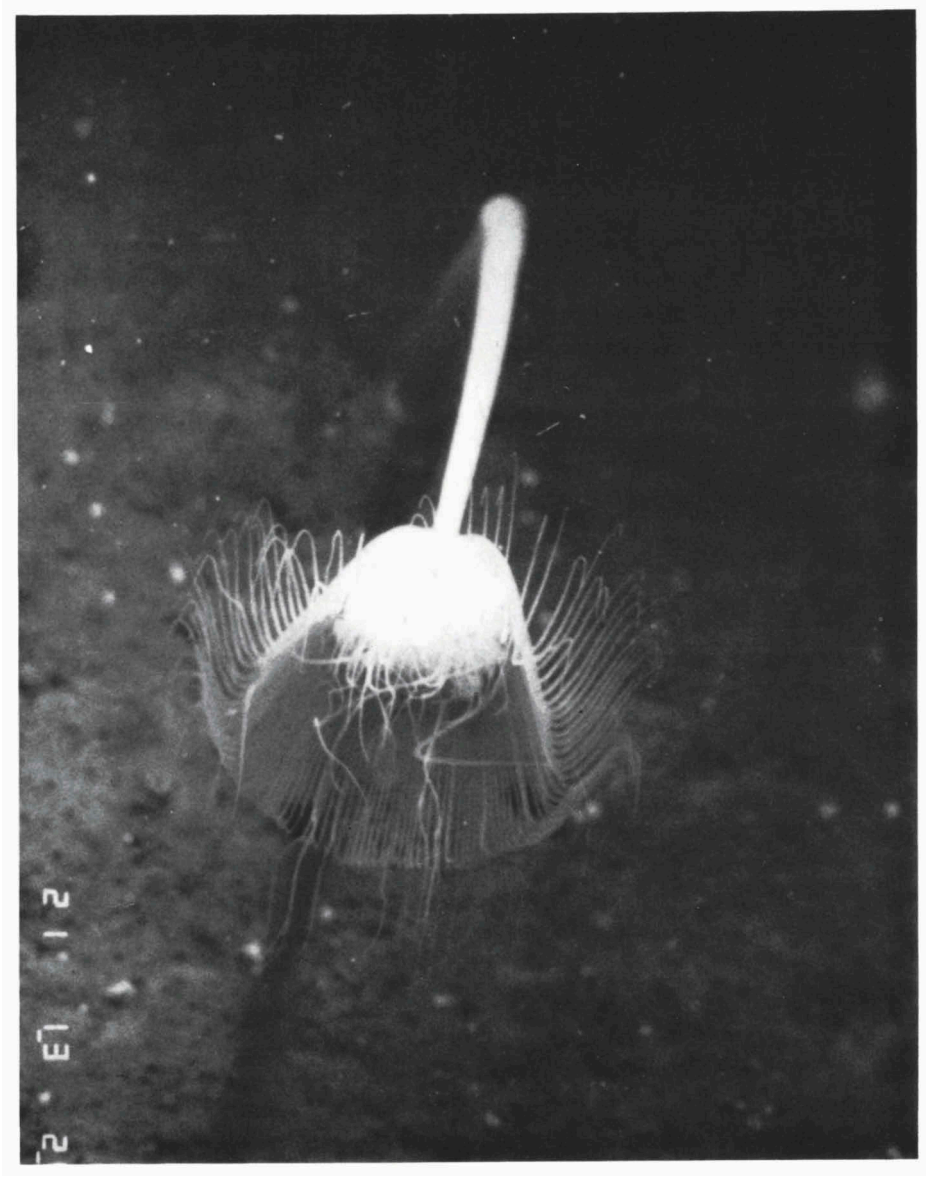

Fig. 1. *Branchiocerianthus imperator* (Allman, 1885) in Sagami Bay, Japan.

and Technology Center. Two specimens were found separately while the submersible moved along a sandy mud-bottom. For observation, the submersible was held close to one of the specimens at a depth of 580 m from 13.05 to 13.40 hrs. local time. The observation was accompanied by stereographic photography and video-camera recordings.

A photograph of a specimen is shown in fig. 1. As there was a moderate current (5-10 cm/sec.) on the site, the hydrocaulus was bent over and the distal 2/3 inclined downstream. The hydrocaulus was about 75 cm long, ending below in a distinct swelling of about 4 cm diameter. The hydranth appeared to hang obliquely from the hydrocaulus. The basal part of the hydranth was disk-shaped, about 75 mm in longitudinal diameter, bilaterally symmetrical, and was attached to the hydrocaulus by the upper (proximal) end. Along that disk-shaped bottom of the hydranth about 135 filiform aboral tentacles were observed. The whorl of tentacles was not complete, there being a hiatus at the upper end of the disk. The tentacles in the broadest part of the hydranth were about 150 mm long. They were all directed downstream in the basal half: thus the specimen gave the impression of the flower of a daffodil on its long stalk. The distal half of each aboral tentacle was sharply recurved, all aboral tentacles thus opening widely backwards to catch suspended particles from the current. The terminal region of most aboral tentacles was directed downstream. From the lower (distal) third of the hydranth the hypostome emerged. Its apical portion carried numerous filiform tentacles surrounding the oral aperture. Between the basal portion of the aboral tentacles and the base of the hypostome a circlet of gonophores arose, each shaped like a cauliflower. This circlet was also interrupted at the upper edge of the disk. The hydranth and gonophores were faint rose-orange in colour and both oral and aboral tentacles were pale orange. The hydrocaulus was milky-white, being palest in the middle.

Abundant suspended particles floated around the hydroid. Some were occasionally caught by the aboral tentacles, transferred by individual tentacles to the oral tentacles and presumably to the mouth. A juvenile myctophid, probably *Diaphus* sp., of 15-20 mm TL was also observed being caught by the hydroid. In this instance, the fish was not trapped by the aboral tentacles but by the oral tentacles, as the fish directly jumped into the oral part of the hydranth. A feeding current was not apparent on the lee side of the hydranth: thus the mechanism for trapping the fish on this occasion is not clear. Movement of the prey in the oral tentacles ceased after 90 sec., death probably resulting from the effect of the nematocysts of the hydroid (cf. Miyajima, 1900): the prey was then taken into the mouth.

A tiny symbiotic shrimp, of about 13 mm body length, was found on the

proximal part of the aboral tentacles near the hydranth. The shrimp was reddish and seemed to be a male of the family Palaemonidae (presumably *Periclimenes* sp. or *Palaemonella* sp.).

An Atlantic specimen of ***Branchiocerianthus imperator*** has been photographed in deep water (4,155 m) of the N.E. Atlantic, 46° 58′20 N, 17° 02′15 W, by an unmanned submersible of the French deep-sea expedition EPICEA of the "Institut Français de Recherche pour l'Exploitation de la Mer" and the "Commissariat à l'Energie Atomique" (IFREMER/CEA, photo 147/031355, "Epaulard IFREMER") (fig. 2). This was apparently a young specimen since no gonophores could be seen on the photograph. The bilateral symmetry of the hydranth, the shape and position of the aboral tentacles and the height of the specimen (slightly more than 1 m) leave no doubt

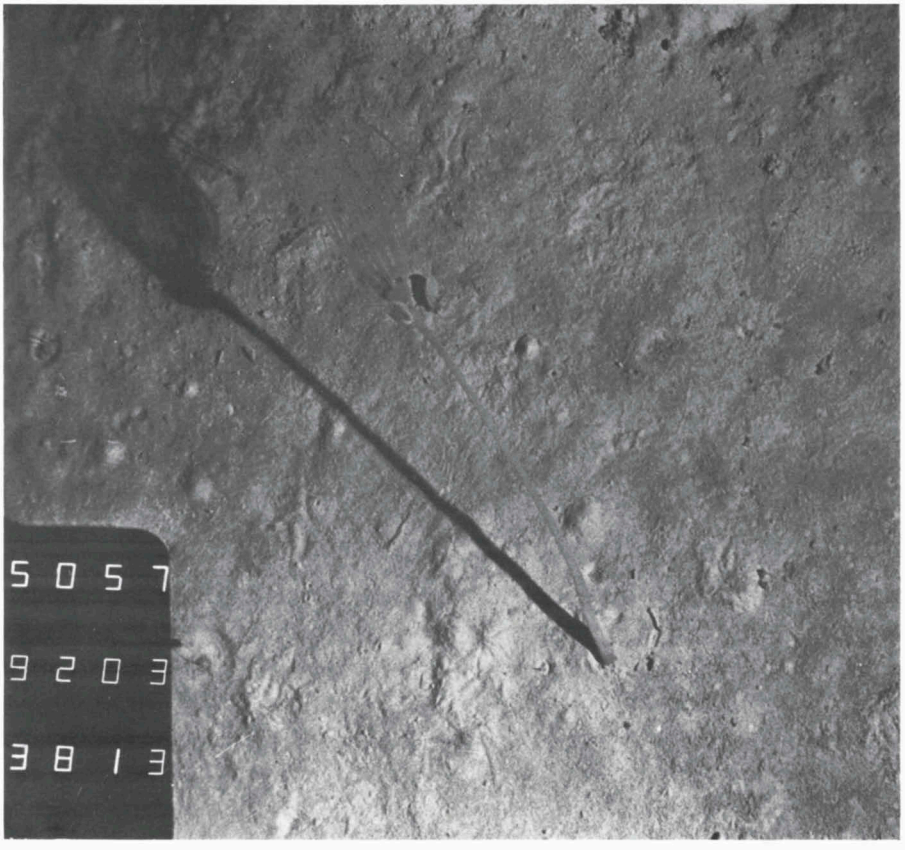

Fig. 2. ***Branchiocerianthus imperator*** (Allman, 1885) in the N.E. Atlantic (photography "Epaulard IFREMER").

concerning its identity. Inspection of colour photographs taken by the French oceanographic expedition GEOCYARISE of the "Institut Français de Recherche pour l'Exploitation de la Mer/Géologie" (CYANA 21) in the eastern Pacific (11° 29'N, 103° 52'W) has revealed the presence of another branchiocerianthid species in the eastern Pacific. In this particular instance the specimens, photographed at a depth of 2,444 m, were attached to a firm substratum, apparently basaltic rocks.

REFERENCES

Allman, G.J., 1885. The Hydroida. — Rep. scient. Results Voy. Challenger, Narrative 1 (2): 751-753, fig.

Allman, G.J., 1888. Report on the Hydroida dredged by H.M.S. Challenger during the years 1873-76. Part II. The Tubulariinae, Corymorphinae, Campanulariinae, Sertulariinae, and Thalamophora. — Rep. scient. Results Voy. Challenger, Zool. 23: i-lxix, 1-90, pls. 1-39.

Millard, N.A.H., 1978. The geographical distribution of Southern African hydroids. — Ann. S. Afr. Mus. 74 (6): 159-200, figs. 1-9, tabs. 1-8, appendix 1 & 2.

Miyajima, M.J., 1900. On a specimen of the gigantic hydroid, Branchiocerianthus imperator Allman found in the Sagami Bay. — J. Coll. Sci. Imp. Univ. Tokyo 13 (2): 235-262, pls. 14-15.

Stechow, E., 1909. Hydroidpolypen der japanischen Ostküste. I. Teil: Athecata und Plumularidae. In: Beiträge zur Naturgeschichte Ostasiens. Herausgegeben von Dr. F. Doflein. — Abh. math.-phys. Kl. bayer. Akad. Wiss., suppl. 1 (6): 1-111, figs. 1-3, pls. 1-7.

Stechow, E., 1909a. Branchiocerianthus imperator von der Küste von Oman und Baluchistan. — Rec. Indian Mus. 3: 296-297.

Vervoort, W., 1966. Bathyal and abyssal hydroids. — Galathea Rep. 8: 98-174, figs. 1-66, tab.

Yamashita, H., 1980. Studies on the benthic organisms collected from the East China Sea and the Yellow Sea. X. Distribution of Porifera and Coelenterata. — Bull. Seikai Reg. Fish. Res. Lab. 55: 13-33, figs. 1-5, tabs. 1-2, appendix.